

REMARKS

The office action rejects claims 1-3, 7, 9, 13, 14, 16 and 18 - 20 under 35 U.S.C. 103(a) as being anticipated by U.S. Patent No. 5,671,158 to *Fournier* (the '158 patent) in view of JP08331766 and in view of U.S. Publication No. 2002/004694 to *McLeod*. Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '158 patent in view of JP9-251328 and in view of *McLeod* and further in view of U.S. Patent No. 6,435,019 to *Vojtisek-Lom*. Claims 4 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '158 patent in view of JP9-251328 and in view of *McLeod* and further in view of U.S. Publication No. 2002/0118657 to *Winchell*. Claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over the '158 patent in view of JP9-251328 and in view of *McLeod* and in further view of U.S. Publication No. 2003/0159044 to *Doyle*. Finally claims 6 and 17 were indicated as being allowable if rewritten in independent form to include the base claim and all intervening claims.

Allowable Subject Matter

Applicant appreciates the Examiner's indication that claims 6 and 17 constitute allowable subject matter if rewritten in independent form to include their base claim and all intervening claims.

103(a) Rejection

Independent claim 1 calls for, among other things,

a base station having respective docking ports for a portable exhaust gas sensor . . . and for an in-vehicle hand portable display device having a data input terminal comprising a keypad,

wherein said base station, gas sensor and display device each include a wireless real-time data transmitter and receiver . . ., and

wherein said gas sensor and display device are detachable from the base station for independent use and each include power packs to provide the necessary power when they are remote from the base station.

Independent claim 13 calls for, among other things,

a base station, a remote exhaust gas sensor, and a remote hand portable display device having a data input terminal comprising a keypad, each being detachable from the base station for independent use,

wherein said base station, sensor and display device further include at least one of a radio transmitter and receiver whereby data can be transmitted and received therebetween.

Both independent claims 1 and 13 call for the base station, remote gas sensor and remote hand portable display device to have at least one of a wireless transmitter and receiver, and for the hand portable display device to have an input terminal comprising a keypad. Moreover, the remote exhaust sensor and remote hand portable display device can each be used independently of one another. Applicant respectfully traverses the rejection of independent claims 1 and 13 over the '158 patent in view of any other cited prior art since the '158 patent fails to teach, disclose or at the very least suggest both a remote gas exhaust sensor and a remote hand portable device comprising a keypad, each being detachable from the base station for independent use and each having at least one of a wireless transmitter and receiver and the hand portable device having a data input terminal.

The '158 patent discloses an emissions testing device having a base station 14, an exhaust pipe sensor probe 20 and a spark plug sensor wire 35. Referring in particular to Figure 3, exhaust pipe sensor probe 20 connects to base station 14 via a hard-wire and, therefore, does not include at least one of a wireless transmitter and receive as called for in the claims. Additionally, display helmet 19, while being wireless, is not a hand portable display device having a data input terminal comprising a keypad as called for in the claims. Instead, the user must enter data via a keyboard 41 that is hard-wired to base station 14 requiring the user to return to the base station (Col. 6, lns. 54 – 58). This configuration is quite impractical

or impossible during an emissions test because the user must operate the vehicle accelerator according to prescribed test routines.

The '158 patent seeks to overcome the problems associated with hard wired keyboards by providing a wireless helmet that communicates with the base station through voice commands and voice recognition software, and that allows the user the ability to view emissions related data remotely from the base station. However, it does not teach, disclose or even suggest providing a wireless exhaust sensor that can be used without long hard-wire leads extending across the work area. The use of hard-wire leads require that the base station be located so that the hard-wired exhaust probe can reach the vehicle being tested. Thus, the leads must be very long and cumbersome to locate the base station out of the testing area or the base station must be located out in the testing area where it is noisy. As a result, the remote voice command helmet is rendered useless or substantially useless because the shop noise and voice variation between users create command recognition issues and input mistakes.

Under the claimed invention, the wireless exhaust sensor eliminates the need to move the base station to a location close to the vehicle being tested and allows for the base station to be located anywhere in the facility so long as the wireless transmitter and receiver range of the base station, remote exhaust sensor and remote display device permit. Additionally, the ability to place the gas exhaust sensor in the tail pipe while the user sits in the car depressing the accelerator and accurately inputting data on the keypad is a substantial advantage over the '158 patent.

The background of McLeod states that one problem with prior art diagnostic systems is that they become obsolete quite quickly as vehicle technology rapidly advances. (Para. 0004 – 0005). Moreover, diagnostic equipment is bulky, occupies large space and each have specific

probes, keyboards and display screens. (Para. 0006). Thus, McLeod makes clear that it would be desirable to work with probes, view the display screen and input commands quickly and efficiently. Additionally, it is also desirable to be able to easily move the diagnostic equipment to different service bays and around the vehicle being tested. (Para. 0007). Thus, McLeod is generally directed to a modular vehicle diagnostic system having a plurality of constituent diagnostic and/or signal processing devices that may be selectively combined to form a vehicle diagnostic assembly. (Para. 0042).

Figure 1 discloses a block diagram of a modular vehicle diagnostic system 10 that includes several devices 14, 16, 18 and 20 interconnected through a communication channel 42, where each device may support one or more applications for a vehicle diagnostics/evaluation system. (para. 0052). Preferably, integrated communication channels are associated with the interlocking mechanisms of two or more devices when large amounts of data must be transferred fast and/or bi-directionally. (Para. 0062). Separate communication channels 36 may be provided between two devices if the devices are not otherwise interlocked. (Para. 0063).

Referring to Figure 2, a group of modules, that include a user interface unit 48, vehicle signal and data interfacing modules 50 and 52, vehicle signals and data preconditioning modules 54, 56 and 64 and auxiliary components 58, 60 and 62, are interconnected by lead wires to central interface unit 48. User interface unit 48 may include a display for displaying vehicle parameters or other information (Para. 0071) and may include a device for inputting information (Para. 0072). User interface unit 48 may include a data processor to control operation of the user interface and/or some or all of the interconnected devices. (Para. 0073). User interface unit 48 may be powered by the vehicle battery, from an AC power supply

though a DC adapter, or may include a battery pack to provide power and/or backup power during testing. (Para. 0076). Thus, user interface unit 48 replaces the base station and connects to the various other modules.

User interface unit 48 may include a plurality of devices that may be selectively interconnected by a solid medium, such as conductive metal or by other modes such as radio waves or electromagnetic radiation. (Para. 0175). The specification makes clear, however, that because several pairs of devices communicate bi-directionally through a serial port, it is preferred that one serial communication protocol be implemented for all devices that input/output data serially. (Para. 0176). Communications between user interface unit 48 and programmable break-out-box 56, amplification unit 54, gas analysis module 58, and data processor 62 occur via serial communication channels. (Para. 0177). Thus, while one select paragraph 175 mentions that a communications channel may be made through radio waves or electromagnetic radiation, the specification expressly states that in the preferred embodiment, communications between gas sensor 58 and user interface 48 should occur serially. Moreover, there is no other disclosure in the figures or the specification that mentions a wireless connection between the user interface unit and the input terminal or gas exhaust sensor. In fact, the remaining disclosure indicates that a gas analysis module 58 receives samples of vehicle exhaust via exhaust intake hose 82 and connects to user interface unit 48 via serial communications channel 70 (Paragraph 0156). Based on the description of the modules and their interconnection with the user interface, one of skill in the art would understand that the radio waves or electromagnetic radiation is transmitted over a very short distance since the modules are mounted directly to user interface unit 48, which provides power to the modules. This is very different from the claimed invention where the wireless gas exhaust probe and

user interface are located at much larger distances and each contain their own battery packs since they are not powered by the base unit. Moreover, the use of a tube to couple the exhaust output to the exhaust gas module creates back pressure on the exhaust system thereby causing the vehicle ECU to adjust the fueling, which causes erroneous emissions testing results.

At paragraph 201, the disclosure expressly states that

to diagnose a vehicle, a mechanic chooses the component or system to be tested and interconnects the modules or devices for performing the desired test. For example, a mechanic that would like a display of the secondary ignition signals of a distributorless ignition system would first conjoin the diagnostics module to the user interface unit. The mechanic would also plug the diagnostic module lead set into the diagnostic module and provide a connection from a power source to the user interface unit. FIG. 29 shows the user interface unit 48 conjoined with the diagnostics module 50 and the lead set 700. The lead set includes power lead 702 connecting AC power supply adapter 704 to the user interface unit 48. The AC power supply adapter includes a plug for connection to an AC power supply.

The disclosure goes on to state in paragraph 204 that

user interface unit 48 serves as a base unit for various assemblies. Additional modules or devices may be obtained at the discretion of a mechanic. For example, a mechanic dedicated to ignition system repair may obtain or purchase only an ignition signal receiver and a diagnostics module. Additional modules, such as a gas analysis module or a scan tool module, may be obtained if the need or desire to expand the capacity of the diagnostic system arises. Further, if advances in automotive or diagnostic technology render a particular module or device out-of-date, that module or device may be replaced without having to replace other devices or modules, such as the user interface unit.

Thus, McLeod fails to teach, disclose, or at the very least suggest a remote gas exhaust sensor and a remote data input terminal containing a keypad, where each contains one of a transmitter or receiver and a battery pack, and each can be used independently of the other. While a fleeting statement indicates that a communication channel may be wirelessly, there is no enabling disclosure on how this would be accomplished to eliminate lead wires or other tubes strewn across the service bay area. Instead, the entire disclosure is dedicated to (1) modules

that are directly connected to and powered by a user interface and (2) that communicate via serial and parallel connections with the user interface such that user interface unit 48 can be held by the mechanic, as clearly shown in Figure 29.

McLeod merely makes vehicle testing somewhat more convenient by making the base station portable. Additionally, it reduces the need to replace the entire system when technology changes since the probes are modular for easy replacement. It does not, however, provide for a wireless remote exhaust sensor and wireless remote user input terminal comprising a keypad, where the wireless remote exhaust sensor and wireless remote user input terminal contain one of a transmitter and receiver, a battery and are detachable from the base station for independent use. The Examiner, in proffering the combination of the '158 patent and McLeod, uses impermissible hindsight by searching for a reference that merely mentions a wireless communication channel and concludes that it would be obvious to one of skill in the art to use the wireless communication channel to replace a hardwired connection between a gas exhaust sensor and keyboard and a base station. However, the Examiner uses Applicant's disclosure for motivation or suggestion to make the combination, as there is no enabling disclosure in McLeod to create a wireless connection between the user interface and the gas exhaust module so that these devices can be detachable and used apart from the base station without having cords, tubes or other tethering devices that attach them to the base station.

And, even assuming that there is such a teaching to create a wireless communication channel between the gas module 58 and user interface 48, it would be to allow the gas exhaust module 58 to communicate with user interface unit 48 over a miniscule distance since McLeod teaches that the module be connected directly to user interface 48 and not for it to be remotely located from the user interface unit as called for in Applicant's claims. As a result, there is no

teaching or disclosure to create a wireless communication channel so that the gas exhaust probe can be placed remotely from the base station (user interface unit) so that a long and cumbersome tube 82 or lead wires (as shown in the '158 patent) can be eliminated.

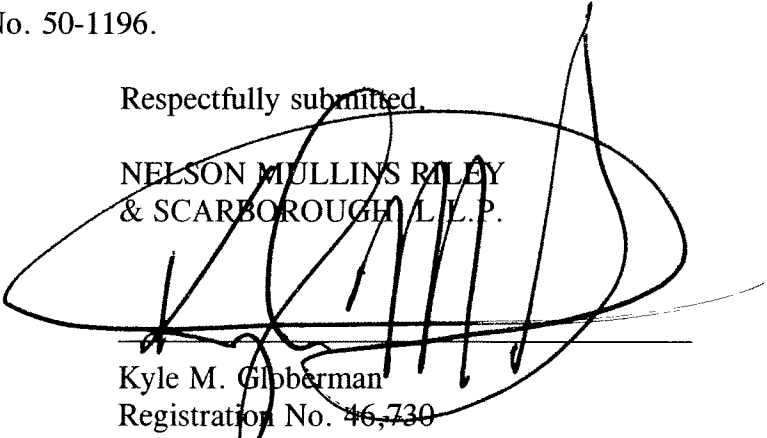
Japanese patent No. 08331766 teaches a docking port for a helmet for recharging the helmet batteries. Thus, the Japanese reference fails to remedy the deficiencies found in both the '158 patent and in McLeod.

CONCLUSION

For at least the above reasons, independent claims 1 and 13 are allowable over the '158 patent, McLeod and JP08331766, and are in condition for allowance. Dependent claims 2 – 4, 6 – 7, 9 – 12 and 14 – 20 directly or indirectly depend from independent claims 1 and 13. These dependent claims recite further limitations and are allowable in their respective combinations. Favorable action and withdrawal of the present rejections and objections is, therefore, respectfully requested. The Examiner is invited to call the undersigned at his convenience to resolve any remaining issues. Please charge any additional fees or credit any overpayment to Deposit Account No. 50-1196.

Respectfully submitted,

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